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GASPÉ OIL REGION,

CANADA EAST.

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1865.

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GASPÉ OIL REGION, CANADA EAST.

GASPÉ is a seaport on the southern side of the Gulf of St. Lawrence. It has a fine harbor, open at all seasons of the year, and is a free port of entry for imports and exports.

Transportation will be entirely by water, and, consequently, very cheap. Oil from this place can be delivered in any of the seaports of the world at much less expense than from any other oil territory yet discovered ; all the oil producing districts so far known and developed, being situated in remote inland localities, and the cost of transportation thence being almost equal to the cost of the oil at the wells. As the cost of transportation must always form a heavy burden on so bulky an article in comparison to its value, it is obvious that oil in a region geographically so well situated as Gaspé, where sea-going vessels may receive their cargoes at the very mouths of wells, a thousand miles nearer to European ports than any other oil district, must command a monopoly in foreign markets.

Oil from Gaspé can be delivered in the port of Liverpool at six dollars per barrel less than from any other oil district ; which may be seen by the following comparative statements :

GASPÉ.

Cost of transportation and other charges on a barrel of oil to Liverpool :	
Cost of empty barrel.....	\$1 60
Cartage, handling, &c.....	1 00
Freight to Liverpool.....	1 20
	\$3 80

PENNSYLVANIA.

Cost of transportation, and other charges on a barrel of oil to Liverpool :

Cost of empty barrel.....	\$3 00
Freight to Pittsburg.....	2 00
Expenses at Pittsburg	20
Freight to Philadelphia	1 36
Expenses at Philadelphia.....	20
Freight to New York.....	50
Expenses at New York.....	20
Revenue tax.....	1 00
Shipping expenses at New York.....	30
Freight to Liverpool.....	1 75

\$10 51

Apart from this great saving in the item of transportation, which of itself is a large profit, Gaspé has many advantages which merit consideration. Labor, available on the spot, is cheap, timber for all purposes abundant ; coal, which in the oil regions of Pennsylvania costs from seventy-five cents to one dollar per bushel, may be obtained at Gaspé at ten cents per bushel ; and barrels can be made on the spot at one dollar and sixty cents instead of the three dollars and twenty-five cents paid elsewhere.

Scientific and practical men agree that the Gaspé oil region promises fully to equal the Pennsylvania region in productiveness, the geological formation being the same or rather more favorable ; there is, therefore, no reason why large flowing wells may not be obtained. But let it be assumed that small wells only are obtained at Gaspé, say wells of twenty barrels each, these being almost a certainty in oil regions. Taking the usual number of working days, and the oil at the low price of four dollars in gold per barrel, a single well would give a *net income of twenty thousand dol-*

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lars in gold per annum. Many such wells would not be necessary to secure a large revenue to a company formed to work them. This calculation cannot be regarded as based upon an over-estimate of either production or price, and in that respect it differs widely from the vague statements which appear in connection with many projects now before the public; for the comparison already presented exhibits the fact that the cost of one barrel of oil delivered in Liverpool, from the wells of Pennsylvania, nearly equals the price of three barrels from the Gaspé district.

The Gaspé oil is of a dark greenish color, with very little odor, and its gravity is greater than that of Pennsylvania. The following reports enter fully into the subject and contain convincing proofs of the existence of oil in large quantities, and the facilities for working and exporting which the Gaspé oil region possesses in a degree that must render it superior to competition.

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EXTRACTS FROM REPORTS
ON THE
GEOLOGY OF CANADA.

Sir Wm. E. Logan, government geologist for the province of Canada, in his Report of a Geological Survey of Canada, published by government in 1863, describes the limestone and sandstone rocks of this region, which are the true petroleum-bearing formation.

In Sir Wm. E. Logan's Report, above mentioned, on page 402, he says :

"There is still to be described the greenstone dyke, connected with the southern anticlinal, at Tar Point. This dyke is of a dark-grey color, weathering to a rusty-red, and it is traversed by numerous horizontal and vertical joints, and abounds in large and small druses, presenting botryoidal surfaces sometimes, and, at others, incrustated with crystal of quartz and calcite. These cavities are filled with petroleum ; this, in some instances, has hardened to the consistency of pitch. The peculiar odor of this substance, which has given the name of Tar Point to the locality, may be perceived at a distance of fifty yards.

"Two petroleum springs occur along the line of this anticlinal. One of these is on the south side of the St. John River, about half a mile above Douglastown. Here the oil oozes from the mud and shingle of the beach, and is seen in globules, rising through the water at high tide. Portions of the oil are said to have been observed, under similar condi-

tions, as far as the extremity of the first marshy island, a distance of three fourths of a mile above; and they may probably extend much farther in the same direction.

"The second spring was observed about two hundred yards up a small branch of the Silver Brook, which is a tributary of the Southwest Arm, falling into it about six or seven miles from Gaspé Basin. The orifice of the spring was not seen; but the oil, which is not observed higher up on the brook, here collects on the surface of quiet pools, as a thick film.

"The rock adjoining the dyke, and underlying both of these springs, is sandstone; but it is not improbable that here, as in Western Canada, the source of the oil may be in the more fossiliferous rocks beneath; so that we may hope to find other springs of it, not only along the line of twenty miles, just indicated, but still farther along this and other undulations in the same region; where borings and wells may furnish more abundant supplies of petroleum."

Again, on page 521, he says:

"In describing these rocks on page 402, the springs of petroleum on the St. John's River and on Silver Brook have already been described, as well as the occurrence of the oil in the cavities of an amygdaloidal greenstone dyke at Tar Point. Other localities of petroleum have since been noticed in that vicinity, at the entrance to Gaspé Basin, and also near the northeast corner of the Douglstown lagoon. About a mile and a half to the southeast of Gaspé Basin, and on the line of the northern anticlinal, is found a layer of mineral pitch or dried bitumen, about an inch in thickness, lying beneath the surface of vegetable mould, while the soil for some distance to the eastward is saturated with petroleum."

Again he says, on page 788:

"The presence of petroleum in the rocks of Gaspé has been mentioned on pages 402 and 521. Subsequent explorations

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tions have shown several additional localities in the vicinity of Gaspé Bay. The rock near the mouth of York River is, like the limestone, impregnated with petroleum; and on the same river, about twelve miles from the entrance of Gaspé Basin, small portions of solid bitumen were found in the cavities of a trap dyke cutting the sandstone. A similar dyke at Tar Point has already been described.

"At the oil spring at Silver Brook, a tributary of the York River, the petroleum oozes from a mass of sandstone and arenaceous shale, which dips southeastwardly at an angle of thirteen degrees, and is nearly a mile to the south of the crown of the anticlinal. The oil, which here collects in pools along the brook, has a greenish color, and an aromatic odor, which is less disagreeable than that of the petroleum of Western Canada.

"Farther westward, at about twelve miles from the mouth of the river, oil was observed on the surface of the water at the outcrop of the limestone. Petroleum is met with at Adams' oil spring, in the rear of Lot B, of York, nearly two miles east of south from the entrance of Gaspé Basin. It is here found in small quantities, floating upon the surface of the water; and near by is a layer of thickened petroleum, mixed with mould, at a depth of a foot beneath the surface of the soil. A mile to the eastward, at Sandy Beach, oil is said to occur; and again at Haldimantown, where it rises through the mud on the shore. These three localities are upon the sandstone, and on the line of the northern anticlinal which passes a little to the north of the Silver Brook Oil Spring. Farther to the southeast, on the line of the southern anticlinal, and about two miles west of Tar Point, which takes its name from the petroleum found there, another oil spring is said to be found, three quarters of a mile south of Seal Cove. On the south side of the Douglastown Lagoon, and about a mile west of the village, oil rises in small quantities from the mud on the beach. Farther to the westward, oil is said to occur on the second fork of the Douglas-town River. Traces of it have also been observed in a



brook near St. George's Cove, on the northeast side of Gaspé Bay."

On page 883, he says :

"On the south side of York River, about five miles above the northwest corner of York township, a mass belonging to the Gaspé limestones comes to the surface, presenting a sharp anticlinal form. The rock is strongly bituminous, giving indications of petroleum. In the York River, just above Keg Brook, the limestone at the summit of the formation is divided into thick beds, of which some are dark gray, weathering reddish-brown, and containing petroleum."

Further extracts might be made from the Report of Sir Wm. E. Logan, showing more interesting discoveries of surface indications, but it is believed unnecessary to multiply them ; all of the localities given are in the immediate vicinity of Gaspé Basin, and all conversant with the boring of Oil Wells and the discoveries of Petroleum, will acknowledge that these surface indications have never been surpassed, and warrant the belief that wells sunk to a proper depth must be highly remunerative.

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REPORT OF
CHARLES ROBB, ESQ., MINING ENGINEER,
ON THE
GASPE ROCK OIL REGION.

53 ST. FRANCIS XAVIER STREET,
MONTREAL, *April 19, 1865.*

GENTLEMEN : In compliance with the request with which you have honored me, I herewith submit such information as I have obtained from actual personal observation, and from other reliable sources, respecting the rock oil region of Gaspé, in Canada East.

I have, during the present season, visited the region referred to, for the purpose of selecting and securing lands for oil-boring purposes.

I have no hesitation in saying that the lands secured by me are the most valuable in the district for the purpose referred to, having been selected either from actual discoveries and indications of oil found on them, or from certain geological and topographical features which experience has proved to be useful as a guide to the best selection.

The oil-bearing rock of Gaspé is a limestone belonging to the Lower Helderberg group of the New York state geologists, and lying at the base of the Devonian system, or about the same geological horizon as the oil region of Enniskillen, in Canada West. It is much disturbed and fissured, and covered with a sandstone formation, which serves to confine the oil within the fissures until tapped by artificial means. Occasionally it is found exuding through small crevices in the overlying sandstone, forming natural oil-springs, of which a

considerable number, as well as several saline and sulphurous springs, are known to exist in the district.

The limestone above described is very copiously charged with organic remains, and the petroleum owes its origin, in all probability, to the slow subterranean decomposition and bitumenization of organic matter, both animal and vegetable, which has been deposited with the other materials of which the rocks are composed. The resulting fluid and gaseous matters, floating on the surface of the water which permeates the strata, will naturally accumulate along the summit of the anticlinal axes or convex folds of the strata, penetrating the fissures and cracks, which will there also be most numerous and important. The investigations of the geologists have revealed the existence of four such folds or anticlinal lines in the oil-bearing rocks of Gaspé.

The importance and value of these lines of anticlinal axis consist, as already explained, in the fact (first pointed out by Dr. T. S. Hunt, of the Canadian Geological Survey) that it is along these lines that the greatest accumulation of oil may always be expected. Being thoroughly satisfied of the truth of this principle, I have selected the land accordingly, for the most part, and it is highly satisfactory to find that all the discoveries of oil throughout the region, whether fully authenticated or only reported, occur on or very near to the lines referred to. The rocks are, for the most part, very lightly covered with earth and clay, so that the lines of anticlinal axis will be easily discovered on the ground, and thus a sure guide to the most favorable places for boring will readily be found.

The country is, for the most part, rugged and mountainous, the mountain chains—reaching to the height of about fifteen hundred feet above the level of the sea—alternating with great valleys, holding considerable rivers and arms of the sea. Numerous transverse valleys also occur, affording extensive flats at many points. The lines of anticlinal axis—where the oil-bearing limestone is not only brought nearest to the surface, but is in the most favorable condition other-

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wise for oil-boring—cut the mountain ranges and the valleys obliquely, and will afford, at many points not difficult of discovery, favorable spots where the sandstone covering will be of moderate thickness.

Independently of all theory, the fact of the existence of the petroleum over a large tract of country in this district is abundantly proved, not only by the appearance of the limestone rock itself which is everywhere found to be highly impregnated with oil, but by the number of places widely apart from each other, at which the oil forces itself to the surface. The most important of these have been described by Sir Wm. Logan in his published report, extracts from which will accompany the present. The locations of these and of several others which have been either observed by or reported to me, during my recent visit, are all included among the lands which have been selected and secured. Previous to my visit to this oil-bearing region, having been much occupied in investigating those of other parts of the country, I had carefully studied its nature and conditions and had thus been led to form a very favorable opinion of it. I am aware, also, from frequent conversations with various officers of the Geological Commission that it has always been regarded by them as a highly promising field of operations in oil-boring. My recent visit has amply confirmed and strengthened the favorable impressions I had thus far been led to form, and I entertain a strong conviction that it is destined to prove a great oil-producing country, and will yield a rich reward to those capitalists who will undertake its development upon an adequate scale.

The lands referred to in this report are all situated in the surveyed and settled part of this district, and are in the immediate vicinity of the magnificent harbor of Gaspé Bay and traversed for the most part by good roads.

The facilities for shipment are thus unequalled, and as Gaspé is a free port of entry the requisite machinery can be imported, and provisions and goods of all sorts procured at a cheap rate. The country is thickly settled with an in-

dustrious and intelligent class of population who will be willing to work at a moderate rate of remuneration. Agricultural produce of all kinds is raised in the district, and wood for fuel, and for the requisite machinery, &c., is abundant.

The climate is remarkably healthy and favorable for working at all seasons, being neither so hot in summer nor so cold in winter as in most other parts of the province. In case it were thought desirable to use coals instead of wood for fuel to the drilling engines, a supply could always be obtained cheaply and expeditiously from Nova Scotia or Cape Breton which are at no great distance from Gaspé Bay.

I have the honor to be,

Gentlemen,

Your most obedient servant,

CHARLES ROBB,

Mining Engineer.

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REPORT OF

PROFESSOR ROBERT BELL,

(Late of the Geological Survey of Canada,)

ON THE

GASPE OIL REGION.

KINGSTON, 11th April, 1865.

GENTLEMEN: I beg to acknowledge the receipt of your letter giving the location of certain oil lands in Gaspé. I have colored in the blocks, which you indicated, upon a township map of Gaspé, and find that they agree with the parts of the territory which I described some time ago as the most promising localities. They are situated (geologically) upon the three main anticlinals of the Gaspé oil regions, and embrace the best portion of the largest tract upon which petroleum has been found.

The lots ranging from Cape Haldimand to the entrance of Gaspé Basin (Sandy Beach range), as well as those of the Dartmouth River range, are located upon the Haldimand, or the most northern anticlinal. Petroleum comes to the surface on several of these lots. First (beginning towards the east) on the Haldimand town plot, at the northeast angle of the Douglastown Lagoon, where it oozes through the mud and shingle on the beach (see General Report of Geological Survey of Canada, 1863, page 789). Next it occurs on some of the lots south of the junction of Sandy Beach with the main shore.

The next locality to the westward, is Adams' oil spring on the southern part of Lot B, York. This spring is situated in the valley of a brook, running into Gaspé Basin, which lies about a mile and a half to the westward. The petroleum

was observed upon the surface of the water, and in the soil for some distance, both up and down the valley of the brook. At the time of my visit to this spot, in the spring of 1862, the ground was very wet and partly frozen, but the roots of a large upturned tree were observed to be covered with lumps of pitch which had resulted from the drying up of the petroleum in past years. The bed from which this pitch was derived is covered with a foot or more of loam and vegetable mould, specimens of which may be seen in the museum of the Geological Survey. This locality is considered a particularly promising one, both from the abundant natural evidences of petroleum which it affords, and its close proximity to the splendid harbor of Gaspé Basin. In the event of oil being struck by boring here, there is every probability—in fact almost a certainty—of its being obtained, anywhere along the brook on the anticlinal, either below or above the oil springs.

The Gaspé sandstone formation belongs to the Devonian system, and immediately overlying the great oil-bearing limestone formation of Gaspé, is the uppermost or surface rock at all the above-mentioned localities.

The Dartmouth range of lots is situated on the westward continuation of the same anticlinal. The Gaspé limestones in this part of the anticlinal comes to the surface in several places on the Dartmouth range, and between the northwest and southwest arms of Gaspé Bay. Some of the limestones of these exposures contains nodules of chert and abundance of fossils, in both of these respects resembling the oil-bearing ("corniferous") limestone of Western Canada.

When engaged in making a topographical survey of the Dartmouth, I observed oil floating on the surface of the water at a "jam" in one of the by-channels near the mouth of the river, and called attention of the rest of the party to the fact, as we could not then be certain that it was actually petroleum, no more attention was paid to the circumstance; but the subsequent discovery of petroleum in the vicinity removes the doubt as to its true nature. All the other lands

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which you mention, with the exception of the second fork on the St. John river, are situated on the second anticlinal, which, from the fact of its terminating on the coast at Tar Point, has been called the Tar Point anticlinal. I shall refer to these lands in their order, beginning at the last as before.

Tar Point was so named, when the country was first settled, from the fact that native tar and petroleum occur in the rocks there; and their odor, filling the air in the neighborhood, cannot fail to be perceived even at a considerable distance. (For particulars of this locality, see, General Report of the Geological Survey, 1863, pages 402 and 403.) The anticlinal runs inland in a west-northwesterly direction, nearly parallel to the Haldimand anticlinal. The long known oil springs to the south side of Douglastown Lagoon, and at Silver Brook, as well as others more recently discovered, lie on its course. The lots which you mention at Seal Cove, are situated upon this anticlinal, and the petroleum of the brooks must come from its central portion or axis. From the geological arrangements of the strata, it is to be inferred, that should a reservoir of petroleum be tapped at this place, the oil will flow readily from the wells, owing to the hydrostatical pressure.

The lots in the ridges behind Douglastown, as well as those of the first and second ranges of York, are very favorably situated on the run of the anticlinal. The petroleum springs along the beach of the south side of Douglastown Lagoon, lie in the strike of the strata between these two blocks of land; and, from what is stated at page 403 of the General Report of the Survey, it appears that petroleum has been observed oozing from the mud and shingle of the beach as far up as the extremity of the first marshy island at the mouth of the St. John river. It is also stated in the same place, that these indications of petroleum "may probably extend much farther in the same direction."

In regard to the lots in the second range of Gaspé Bay south, it is to be inferred from their close connection with

the Silver Brook oil spring, situated on the same anticlinal, and in the strike of the strata upon these lots, that the circumstances are such as to favor the opinion that oil will be found by boring in the most encouraging places in this area.

The locality, on the second fork of the St. John river, at which petroleum was found by settlers from another part of the township, is situated upon a different anticlinal from the others. It is called the Point Peter Anticlinal, and is the third in order from the north. It runs quite parallel to the Tar Point Anticlinal. The prevalence of free petroleum in the limestones of this part of the oil district, and other considerations, appear to warrant the sinking of wells on this block. The place is easily reached, either by the road from the southwest arm of Gaspé Bay, or by following the valley of the St. John river.

GENERAL REMARKS.

The Gaspé limestones (from which the petroleum appears to be mainly derived) is 2,000 feet and upwards in thickness. It is generally of a dark gray color, in both thick and thin beds, sometimes traversed by strings of calc-spar, and often holds nodules of chert. The latter are frequently abundant in the limestones of other petroleum regions. This limestone formation has a wide geographical range in the peninsula of Gaspé, but the portion which is most remarkable for affording petroleum, occurs in the region lying to the southward and westward of Gaspé Bay. The limestone in this tract, when broken, has almost always an unmistakable odor of rock oil. When a newly fractured fragment is thrown into water the oil rises from it to the surface, forming a thin greasy scum. When a crack, druse, or cavity of any kind occurs in the bed of the rock, it is generally found to contain more or less petroleum. The sandstone which overlies the limestone, throughout a great part of its distribution, is also sometimes found to be saturated with free petroleum. The

petroleum from the natural springs in Gaspé is of excellent quality, is of a greenish brown color, and has but little odor.

The springs at Silver Brook and Douglastown were described by Sir W. Logan twenty years ago (see Report for 1844); but the time of their first discovery is unknown. The county of Gaspé, being far removed, and in a manner isolated, is but little known to the majority of Canadians. This circumstance, and the want of capital coupled with enterprise, appears to have been the chief reasons which have hitherto retarded the development of these oil lands. There is, probably, no oil region in North America so well situated for shipping petroleum to market as that of Gaspé. The harbor of Gaspé and Gaspé Basin are all that could be desired in the way of secure accommodation for vessels of all classes.

From the knowledge of the Gaspé Peninsula and its geology, acquired during three seasons spent there in making geological surveys and explorations, under the direction of our provincial geologist, Sir Wm. E. Logan, I am confident that, when properly tested, those portions of the country which I have already indicated will prove highly productive of petroleum; and this opinion is also entertained by gentlemen from the Pennsylvanian oil region, whom I met with in Gaspé in 1862. These lands could not have been more judiciously selected, and there is a great advantage in having them scattered over a wide area, since future experience may prove some portions of the oil district to be much more productive than others.

In the foregoing remarks I have not entered into the subject of roads, rivers, wharves, the supply of labor, the price of provisions, &c., in Gaspé; but, should you require it, I shall probably be able to furnish you with any information you may wish for in regard to these matters.

Your obedient servant,

ROBERT BELL, C. E., F. G. S.,
*Prof. of Chemistry and Natural History,
Queen's University.*





